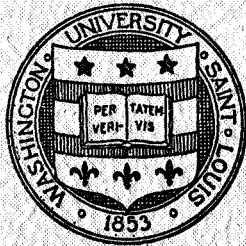


N69-70733

**THE GOVERNMENT-ORIENTED
CORPORATION**

by Murray L. Weidenbaum
Professor of Economics
Washington University
December 1968
Working Paper 6820



**DEPARTMENT OF ECONOMICS
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI**

**THE GOVERNMENT-ORIENTED
CORPORATION**

**by Murray L. Weidenbaum
Professor of Economics
Washington University
December 1968
Working Paper 6820**

Preface

This paper draws upon earlier research under the Washington University NASA Economic Research Program to highlight one of the striking long-term impacts of space and related government programs: The rise of the corporation oriented primarily to government rather than commercial markets.

Earlier revisions were presented to a Department of Economics Seminar at The University of Colorado and to a conference on "Independence and Accountability in Government Contracting," sponsored by the Carnegie Corporation.

Research support was received from the National Aeronautics and Space Administration through its Grant NGR 26-008-003 to Washington University. The views expressed are solely those of the author.

THE GOVERNMENT-ORIENTED CORPORATION

By Murray L. Weidenbaum

Introduction

As government agencies, notably those dealing with military and space matters, have come to depend on new systems and equipment of a highly scientific content, they have grown to depend less and less on their own laboratories and arsenals to design and produce the materials they use. Increasingly, the research, development and production of military, atomic energy, and space systems are being performed in the private sector via government contracts with large industrial corporations.

Were the governmental purchases similar to those of the private sector, this might not be a noteworthy development. However, so much of these procurement funds is devoted to fairly exotic items for which there are rarely established private markets -- missiles, space vehicles, nuclear-powered aircraft carriers, desalinization systems, atomic energy items, and so forth.

As a result, the companies serving this specialized government market develop capabilities different than those required for successful operation in traditional commercial markets. There is a feedback here. As these companies become less effective in competing for private business and more adept at obtaining public contracts, they become heavily dependent on the government customer. Conversely, the Department of Defense maintains little capability to produce the equipment that it needs. Hence, it has come to rely almost entirely on these government-oriented corporations. Both parties -- private and public -- become "locked in" to a symbiotic relationship where they depend on each other.

A "demonstration" effect in other parts of the public sector is now taking place. Civilian government agencies that require on occasion large-scale technological development and production efforts are also turning to the government-oriented corporations. In most cases to date, these are the same corporations as those which

dominate the military market and the products that they produce are similar. The two largest examples are space systems for NASA -- an outgrowth of military ICBM programs -- and the development of a supersonic transport aircraft (SST) under the sponsorship of the Department of Transportation -- an extension of military aircraft developments. Thus far, the government-oriented corporations have not played an important role in domestic welfare programs. There are growing pressures for changing this situation.

Up to the present time, the two major mechanisms available for decentralizing Federal activities -- the government-oriented corporation and grants to the states and localities -- have been utilized in quite different fashions. The government-oriented corporation has been used in national security and related high technology programs, while grants-in-aid have been used primarily in connection with welfare and other domestic programs.

The difference in the quality of resources made available for public programs by the two mechanisms is striking. Compare the income and educational levels of the engineers, scientists, and other highly educated, innovative professionals working on missile or space systems with the typical employee of state highway departments or local welfare agencies. Compare the concentration of science and technology in national security programs with their virtual absence from domestic welfare activities. For example, all state agencies combined (excluding colleges and universities) spent a mere \$88 million for research and development in 1965 compared to the Federal Government's R & D budget of \$16 billion, seven-eighths of which was devoted to military applications, space and atomic energy.^{1/}

Extending the Use of the Government-Oriented Corporation

In a significant effort at diversification, the major defense-space contractors in recent years have made numerous attempts to penetrate, as well as to develop, civilian markets within the public sector itself. Although the dollar volumes of these

undertakings are still small judged by the scale of military and space programs, they do involve government agencies doing business with high-technology private enterprises that were originally attracted to government work by the military establishment.

The present appears to be a period of substantial exploration on the part of both government agencies and business enterprises in assessing the kinds of relationships through which they can successfully do business with each other. It is, hence, early to judge the successes or failures. Four areas seem to stand out as civilian public sector activities where the type of systems analysis and advanced technology possessed by the leading military-space contractors can usefully be utilized: transportation, water systems, communications systems, and regional development.^{2/}

Improvements in Transportation

A current example of innovative transportation work by a government-oriented corporation is the development by Lockheed Aircraft Company of a transportation plan for the Sudan. This work is being undertaken through contracts with the Agency for International Development and the Sudan's Ministry of Finance and Economics. In its systems analysis of Sudan transportation, Lockheed is charged with developing a broad plan for development of all forms of transportation, indicating specific projects and establishing priorities among them.

Within the United States, TRW, Inc., is conducting detailed engineering studies of transportation requirements for the Northeast Corridor. The company is evaluating, for the Department of Transportation, alternative modes and travel concepts which can be used in a safe and convenient high speed ground transportation network.

Development of Water Systems

Several government-oriented corporations (Aerojet-General, General Dynamics, McDonnell-Douglas and United Aircraft) have been testing to determine whether waste water can be reclaimed through "reverse osmosis" (filtering out impurities with thin

membranes). The General Dynamics Corporation has been working with sanitation authorities in Los Angeles County and the City of San Diego. Westinghouse Electric Corporation is under contract with the State of Pennsylvania to determine whether techniques used for desalting water can be employed to purify acid mine drainage, a major source of stream pollution.

Communications Systems

Many defense-space contractors have obtained civilian government contracts in which modern computer technology is drawn upon to improve communication systems, notably in the areas of education, health, and justice. For example, Aerojet-General Corporation has been working with the California Department of Education on a computer system for evaluating teacher credentials. Northrop Corporation is under contract with the State of Pennsylvania to develop a criminal justice information system. On a broader scale, Lockheed Aircraft Corporation is designing statewide information systems for Alaska, California, and West Virginia.

Applying the Systems Approach to Area Development

The most far-reaching attempt thus far to apply systems analysis to the economic development of a region is the contract with the Government of Greece under which Litton Industries has committed itself not only to analyze and plan the growth of industry in an underdeveloped area, but actually to attract new investment to it. On a much less ambitious level, General Electric Company's center for advanced studies, TEMPO, is working with the City of Detroit to introduce budgeting techniques learned through its cost-effectiveness work on projects of the Department of Defense.

A Need for Rethinking

It is not hard, thus, to work up considerable enthusiasm for the nation attaining some civilian return on its massive investment in military and space through the type of undertakings described above. However, we now have several decades of

experience with the use of the government-oriented corporation in military and space programs, and an assessment reveals some serious side-effects. These unintended impacts of the government-industry relationship appear worthy of some analysis, particularly prior to any wholesale utilization of the government-industry relationship in the civilian public sector.

The following sections of this paper describe the nature of the government-oriented corporation as it has developed in carrying out military and closely related programs (e.g. exploration of outer space). Some of the generally overlooked effects of the use of this mechanism are examined. The paper ends with suggestions for policy changes which would make private business firms more effective instruments of public policy and maintain their essentially private characteristics.

The Role of the Government-Oriented Corporation

Four-fifths of Federal purchases from the private sector consist of goods and services for the military and space programs. The great bulk of these procurements is not made in circumstances where a great number of firms present sealed bids offering to sell fairly standard commercial stock items at fixed prices. If this idyllic situation were to prevail, it is most unlikely that the phenomenon of the government-oriented corporation would have arisen at all. Rather, the typical Federal procurement involves acquiring a highly-engineered system designed and produced to the government's own specifications and for which there are no established private markets.

The Leading Government Contractors^{3/}

An analysis of the composition of the firms supplying these government markets lends important insights into the nature of the government-oriented corporation. Because these high technology markets are so completely subject to the changing needs of the governmental customer, relationships between buyers and sellers differ from

those typical in the commercial sector of the economy. By the selection of contractors, the government can control entry and exit, can greatly affect the growth of the firms involved, and can impose its way of doing business on the companies participating.

The bulk of the contracts are let as a result of negotiation with a group of suppliers chosen by the buyers. The governmental buyers normally request proposals from the firms that they consider to be in a position to undertake the magnitude of R & D and production required. However keen the competition among the prospective suppliers may become, it will relate primarily to their technological capability and not simply to price. Hence, the nature of the buyers' demands may be far less a direct function of their budgets than of the products or systems available through technological advance. When technology produces space boosters for example, the Federal Government begins to develop an effective demand for exploring outer space.

Major portions of the work contracted for are performed by corporations oriented to public requirements rather than market demands. These government-oriented corporations are companies or fairly autonomous divisions of large, diversified corporations whose dominant customers are the defense and space agencies of the Federal Government. The close, continuing relationship between the government and these corporations is more than regulation by Federal agencies or selling in markets where the government is a major determinant of price, as in the case of public utilities, agriculture, or mining. Rather, it is the intertwining of the public and private sectors so that it is difficult to identify when specific entrepreneurial or management functions in a given company are being performed primarily by government agents or by private individuals on business payrolls. As will be described subsequently, the contract mechanism provides the basic means for such governmental intervention.

A relatively limited number of companies receive the bulk of the defense and space contract awards. In the fiscal year 1967, the 100 companies obtaining the

largest dollar volume of military prime contracts accounted for two-thirds of the Department of Defense total. In the case of NASA, the top 100 companies received nine-tenths of the total contracts awarded during the year.

Who are the government-oriented corporations? An analysis of the size distribution of the top 100 DOD contractors provides another dimension to the structure of government markets. The giants of American industry do not dominate, contrary to much of the writing of the so-called military-industrial complex. Rather, the medium size corporations receive the largest share of the orders for high technology government products. The 27 corporations with assets of \$1 billion or over received only 17 percent of the DOD contracts in 1965. This group includes General Motors, Ford, Standard Oil of New Jersey, RCA, Uniroyal, Eastman Kodak, Firestone Tire and Rubber, and International Harvester. In contrast, the 30 companies with assets in the \$250-999 million range received 39 percent of the contracts, the largest share of any group. Typical firms in this category are the aerospace and electronics manufacturers -- Boeing, Hughes Aircraft, Lockheed, and North American Rockwell. These certainly are not pygmies among business firms in the United States; neither are they at the very top rung of American industry. As might be expected, relatively small companies did proportionally poorer; the 37 companies with assets below \$250 million accounted for only 11 percent of the total.

Another dimension of the structure of this government market relates to the extent of dependence on government work among the major contractors. Again, the data indicate that the firms most heavily dependent on military orders -- those primarily oriented to government rather than private markets -- are the medium size companies rather than the giants of American industry. Of the top 100 defense contractors in 1965, for the seven with assets of \$5 billion or over, defense contracts equaled less than 10 percent of their sales in all cases. For those 20 firms with assets in the \$1 - 5 billion range, defense orders equaled less than 25 percent of

sales. In contrast, 21 out of the 44 firms with assets of \$100-999 million obtained defense contracts exceeding 25 percent of their sales; in the case of 10 of these firms -- AVCO, Collins Radio, General Dynamics, L-T-V, Lockheed, Martin-Marietta, McDonnell, Newport News Shipbuilding, Northrop and Raytheon -- these government orders exceeded half of their sales volume. These are clearly the "government-oriented corporations."

Also the majority of the smaller firms, those with assets under \$100 million, received defense contracts exceeding 50 percent of their sales. This experience is hardly typical of the thousands of smaller businesses participating in government markets. Rather, it reflects the nature of the sample, which is limited to firms receiving the largest absolute amounts of defense contracts.

During the past decade, over 80 percent of the government procurement of high technology products and systems has been made through negotiated rather than sealed-bid purchasing. Clearly, the prices that the government pays for these goods and services are not determined by the interplay of relatively impersonal market forces. Some observers relate the lack of competition and sealed bidding to the concentration of government business within a relatively few firms.

Adverse Side Effects

The tendency for the military establishment to rely on a fairly limited group of suppliers for the bulk of its needs has resulted in a fairly unique government-industry relationship. In their long-term dealings with these corporations that cater primarily to specialized government markets, Federal Government agencies such as the Department of Defense and NASA gradually have taken over directly or indirectly many of the decision-making functions which are normally the prerogatives of business management.

A detailed analysis of the largest segment of these government markets, Air Force procurement, recently concluded that "A new structural relationship has been

created in which the Air Force, as a buyer, makes specific management decisions about policy and detailed procedures within aerospace companies that sell defense systems to the Air Force." ^{4/} This development may well be the most significant long-term impact of governmental procurement expenditures on the private sector of the American economy.

The public assumption of, or active participation in, private business decision-making takes three major forms: influencing the choice of products the firm produces, the source of capital funds that it uses, and its internal operations. ^{5/} It needs to be kept in mind, of course, that this government involvement in private industry arises mainly in the case of the "government-oriented" corporations which operate primarily in the unique and large-scale nature of military weapon system, space system, atomic energy development, and related high technology purchasing by the government. It hardly characterizes the procurement of standard conventional items by all government agencies through fixed-price contracts awarded via sealed-bid competition.

By awarding massive contracts for research and development (\$10 billion in the fiscal year 1966) the Department of Defense and NASA have come to strongly influence or determine which new products their essentially common group of contractors will design and produce. The governmental customers thus directly finance the R & D efforts and assume much of the risk of success or failure. In the commercial economy, in contrast, research and development costs normally are only recovered to the extent that they result in the sale of profitable products. Hence, the decisions to embark upon a product research and development program are made by the sellers, who bear the risk of not recovering their technological investment.

Of course, government contractors may and do sponsor and fund some of their own R & D effort. However, the bulk of their R & D is performed under government contract. Much if not most of the remainder is charged as allowable overhead on

their government contracts, having met the approval of contract administration officials. In good measure, military and space product design and development is not an intermediate good but an end product which the contractor produces for sale to the government under contract awarded before the R & D is undertaken.

A committee of senior government officials, chaired by then Budget Bureau Director David Bell, reported to the President in 1962 that "...The major initiative and responsibility for promoting and financing research and development have in many important areas been shifted from private enterprise (including academic as well as business institutions) to the Federal Government." The Bell Committee went on to point out that unlike the present situation where the Federal Government finances the bulk of the national expenditure for R & D, prior to World War II most of the nation's research achievements occurred with little Federal support. ^{6/}

The government also uses its vast financial resources to supply much of the plant and equipment and working capital used by its major contractors. A survey by the Stanford Research Institute of 13 of the largest military contractors, covering the years 1957 to 1961, revealed that the cost of government-supplied property exceeded gross company property reported on corporate balance sheets. ^{7/} Moreover, much of the company-owned property was used by the commercially-oriented divisions of these companies, rather than by the divisions working on government contracts.

More recently, Department of Defense expenditures for additional plant and equipment to be supplied to its contractors have risen sharply, from \$56 million in the fiscal year 1965 to an estimated \$330 million in the fiscal year 1967. Historically, the major expansions in government-supplied facilities have occurred during war-time periods. Post-war reductions in such assistance have not been on a scale to offset the expansions during hot war. Hence, the long-term trend has been for large-scale Federal supply of fixed capital to these governmentally-oriented corporations.

In addition, approximately \$5 billion of outstanding 'progress' payments are held by military contractors. Some firms report that such government-supplied funds exceed their total net worth. Military procurements regulations provide specific disincentives for the use of private working capital. As specified in the Armed Services Procurement Regulation, progress payments equal to 80 percent of the costs incurred in government contracts generally are provided without interest charge to the contractors. 8/

However, should these companies decide to rely on private sources for working capital, their interest payments may not be charged to the contract and hence must come out of their profits. Presumably, this arrangement results in smaller total cost to the government because of the lower interest rates paid by the U. S. Treasury on the funds that it borrows. However, the result also is to increase the extent to which public rather than private capital finances the operations of government contractors. Hence, the financial stake that the government has in the performance of its contractors is increased further.

Perhaps the most pervasive way in which the Federal Government assumes the management decision-making functions of its systems-type contractors is through the procurement legislation and regulations governing the awarding of these contracts. For example, the Armed Services Procurement Regulation requires military suppliers to accept on a 'take it or leave it' basis many standard clauses in government contracts which give the military contracting and surveillance officers numerous powers over the internal operations of these companies. Since NASA is also governed by the Armed Services Procurement Act, it attempts to follow the ASPR.

These unilaterally determined grants of authority vary from matters of substance to items so minor that they border on the ludicrous. Of course, in many instances these restrictions have been imposed to prevent specific abuses or even in an effort to aid the contractors. One extremely knowledgeable defense official,

Graeme C. Bannerman, Assistant Secretary of the Navy (Installations and Logistics), stated that these policy and procedural changes "are designed not to provide rigidity or to inhibit judgment, but rather to establish a framework within which the widest discretion may be exercised in dealing with each individual transaction." But then, as Professors George Steiner and William Ryan, commenting on the Bannerman statement, point out:

"It is difficult for us to see how increasing the number of directives which apply to industry, then placing these detailed regulations in the hands of the average contract administrator, will increase the contractor's freedom." 9/

Certainly, governmental policymakers in the area of military contracting rarely consider the cumulative and long-term impacts on company initiative and entrepreneurship. Viewed as a totality, these restrictions represent a new form of government regulation of industry. This regulation is not accomplished through the traditional independent regulatory commission, subject to the Administrative Procedures Act and similar judicial-type legislation, but rather through the unilateral exercise of the government's monopsonistic market power.

The authority assumed by the governmental "customer" includes power to review and veto company decisions as to which activities to perform in-house and which to subcontract, which firms to use as subcontractors, which products to buy domestically rather than to import, what internal financial reporting systems to establish, what type of industrial engineering and planning system to utilize, what minimum as well as average wage rates to pay, how much overtime work to authorize, and so forth.^{10/} As Professor Michael Reagan has described, "When a business firm enters into a contract with the government,...The quasi-public nature of the contracting firm is given implicit recognition by requirements that the firm conduct itself similarly to a government agency in abiding by policies that bind such an agency." ^{11/}

My favorite example of the more minor matters covered in the detailed and voluminous military procurement regulations is the prescription that the safety rules followed in the offices and factories of the contractors must be consistent with the latest edition of the Corps of Engineers' safety manual.

This entire philosophy and attitude of close government review of the internal operations of its contractors is so deeply imbedded that when statements such as the following one are added to the Armed Services Procurement Regulation they evoke no public or industry reaction:

'Although the Government does not expect to participate in every management decision, it may reserve the right to review the contractor's management efforts...' 12/

Cost-plus contracting has shifted much of the risk-bearing from the industrial seller to the governmental buyer. The use of fixed price contracts by the Department of Defense has increased in recent years. However, a major share of military contracts still is on a cost reimbursement basis. So long as this remains the case, the government determines which items of cost are "allowable" as charges to the contract, and hence, to a large extent this determines or at least strongly influences which activities and which items of expenditure the company can profitably undertake (disallowed costs directly reduce company net profits).

The government-industry relationship is a dynamic one. Numerous changes are made in military procurement regulations in the course of a year. Many of these changes further extend the role of the government in the internal operations of the contractors. The following is a sample of new regulations during the year and a half ending October 1967: In contracts for aircraft tires, tubes and recapping, the contractor must purchase an amount of rubber from the government's stockpile equal to at least 50 percent of the value of the contract. The contractor does not actually have to use the rubber from the stockpile in filling the government contract. He can keep it for his commercial work. Similar requirements, somewhat less restrictive in

their particulars, must be met by contractors who provide aluminum products, while military contractors must buy all of their jewel bearings from the government-owned Turtle Mountain Bearing Plant at Rolla, North Dakota. Of course, if such tie-in contracts were made between two private firms, they would run afoul of the anti-trust laws.

In deciding whether costs of professional and consulting services used by a contractor are an allowable charge to a military contract, the government now decides "whether the service can be performed more economically by employment rather than by contracting" that is, whether one of its contractors should hire an outside consultant rather than a permanent employee (the government also assumes the authority to review the qualifications of the consultant).

Help-wanted advertising is no longer an allowable cost if it is in color. Advertising for employees, if it is to be an allowable cost, must be authorized in advance.^{13/}

Moreover, the Pentagon recently has reported that it is reviewing "what actions on the part of the government are necessary to assure that compensation paid to contractor employees performing on government contracts is reasonable."^{14/} Clearly, the trend for increased governmental involvement in private business decision-making appears to be a long-continuing one.

Also, Congressional committees have shown a growing concern during the past year with the efficiency of defense procurement, the profitability of defense contracts, and the controls exercised over Federal equipment used by government contractors.

Analyzing the problem from the viewpoint of the individual defense industry executive, Steiner and Ryan reported that when company managers are faced with a large mass of government regulations, they spend time completing forms which ought better be left to performance. The typical application of Government regulations is

designed to insure, on the average, satisfactory performance, or, conversely, to prevent failures. However, in doing this, the Government often inhibits the performance and innovation on the part of project managers. 'Tightened controls resulted in their performing under their capability.'^{15/}

Looking at defense-space companies as a whole, there are numerous specific indications these government-oriented corporations have displayed little entrepreneurial initiative. The dependence of the shipbuilding companies on government contracts and subsidies is well known. It has resulted in that industry's failure to undertake new product development on its own or otherwise effectively to compete in the open world market. Similarly, the aerospace industry generally has made numerous but only half-hearted efforts to utilize its much vaunted engineering and systems analysis capability to penetrate commercial markets. Their non-aircraft diversification efforts mainly have been limited to the governmental environment with which they are so familiar.

Possible Policy Changes

Recent periods of defense cutbacks gave rise to demands for utilizing the supposedly unique research and development and systems management capabilities of military contractors in civilian public sector activities. Indeed, the current concern over the need to respond to the racial problems in the centers of the nation's major cities has resulted in renewed pressures for putting to work the science and intellect of our major high technology corporations in the fields of education, training, mass urban transportation, urban redevelopment, and the reduction of poverty generally. Given a decline in military-space spending in the near future, such action may also be an effective short-term means of preventing unemployment in defense areas. However, as a matter of long-term public policy, would it be wise for the nation to expand that branch of industry which increasingly develops the characteristics and mentality of a government arsenal? At the least, the possible

existence of adverse side-effects should be recognized and taken into account in extending the utilization of the private corporation in the government's business.

Reducing the Close Government-Industrial Relationship

Governmental procurement policies and practices may need to be modified in order to halt the erosion of the basic entrepreneurial character of the firms that undertake large-scale developmental programs for the Federal establishment. The plea for "disengagement" made by defense and space contractors might be given greater weight, although the public interest would necessitate continuing protection and concern.

One way of reducing the financial dependence of defense-space companies on the government would be to make interest on working capital an allowable cost on military and space contracts. Interest on indebtedness is a standard cost of doing business and should be recognized as such. Unlike the period of rapid and uncertain expansion of defense work in the early 1940's, military and space contracts are now an established feature of American industry. The Treasury no longer needs to serve as banker.

A second way of strengthening the private entrepreneurial character of defense-space firms is to streamline and reduce the variety and scope of special provisions in procurement legislation and regulations. Let these companies develop their own safety rules to discourage employees from skidding on factory floors. We seem at times to forget why in the first place we prefer to use private enterprise rather than government arsenals to develop and produce most of our weapon systems. It is not because private corporations are better than government agencies at following rules and regulations - at doing it by the numbers. It is precisely for the opposite reason. We hope that private enterprise is more creative, more imaginative, and more resourceful.

A third way of reducing the close, continuing relationship between the Federal establishment and its major suppliers is to broaden the competitive base. This could be accomplished by encouraging commercially-oriented companies to consider military and space work as a possible source of diversification for them. The recommendations concerning interest on working capital and streamlining procurement procedures should help on that score. Also, defense-space companies could be encouraged to diversify into commercial markets. It may be natural for procurement officials to favor firms whose interests are not "diluted" by commercial work. However, the diversified company may also be the more efficient one in the long run. Certainly, the diversification of industry both into and out of high technology government markets would reduce the present tendency for a relatively small number of companies to become primarily dependent on Federal business.

Another method of broadening the competitive base would be to emphasize production rather than R & D as the major point of competition. This could be done by doing more of the design work in Federal laboratories and making the designs available to the various private companies who would bid on the production work. Substantial precedents exist for this approach. NASA did the primary development work on the Saturn rocket booster, and subsequently commissioned private industry to produce the boosters. Alternatively, the design and development work could be done in the private sector, with the companies competing for this kind of work not being permitted to bid on production contracts.

At present, much of the military subcontracts go to companies that are prime contractors on other systems. More attention in the award of subcontracts could be paid to small business and other industries not actively participating in the military market as primes. Some thought also could be given to reducing the competitive advantages that accrue to the dominant primes that hold on to government-owned plant and equipment for long periods of time. The free provision of these

assets also explains their high profit rates. The simplest approach, of course, would be to curtail the practice of furnishing plant and equipment to long-term government contractors and, instead, to give them greater incentives to make their own capital investments.

Application to Civilian Public Sector Activities

Certainly, the detailed day-to-day governmental surveillance of internal company operations which is so characteristic of the weapon and space system markets would appear to be a poor precedent to follow in establishing the relative roles of industry and government in such civil public sector areas as urban rehabilitation, environment pollution control, and training and education.

On the positive side, governmental procurement of goods and services from the private sector might well emphasize the end results desired by governmental decision-makers, rather than the detailed manner in which industry designs and manufactures the final product. In its essence, this is the difference between detailed design specifications prepared by the governmental buyer versus clear statements of performance desired by the government. The latter approach, of course, gives maximum opportunity for private initiative and inventiveness to come to bear on the problems of the public sector.

That, of course, is the basic and difficult task of using private enterprise in the performance of public functions without either converting the companies to unimaginative arsenalized operations or letting them obtain windfall profits because of the government's inability to drive hard enough and intelligent enough bargains.

The answer is neither simple nor apparent. In part, however, it does lie in governmental policy-makers and administrators constantly being aware of the need to steer that difficult middle course between governmental arsenalization of industry, on the one hand, and private interests obtaining high profits unrelated to either the investments they have made or the risks that they have borne, on the other.

Footnotes

1/ U.S. National Science Foundation, R & D Activities in State Government Agencies, Fiscal Years 1964 and 1965, Washington, U. S. Government Printing Office, 1967, p. VII and Federal Funds for Research, Development and Other Scientific Activities, Fiscal Years 1964, 1965, and 1966, Washington, GPO, 1965, pp. 22-26.

2/ Aerospace Industries Association, Aerospace Technology: Creating Social Progress, Washington, D. C., 1968.

3/ This section is based on M. L. Weidenbaum, Competition in High Technology Government Markets, Washington University, Department of Economics Working Paper 6713, November 1967.

4/ Edward J. Morrison, "Defense Systems Management: The 375 Series," California Management Review, Summer 1967, p. 17.

5/ This section is based on M. L. Weidenbaum, Arms and the American Economy: A Domestic Convergence Hypothesis, Washington University Department of Economics Working Paper 6717, December 1967.

6/ David Bell et al, Report to the President on Government Contracting for Research and Development, April 30, 1962 (reprinted in U. S. House of Representatives, Committee on Government Operations, Systems Development and Management, Part I, Washington, GPO, 1962, pp. 202-203).

7/ Stanford Research Institute, The Industry-Government Aerospace Relationship, Vol. II, Menlo Park, California, 1963, p. 119.

8/ Armed Services Procurement Regulation, Section E-503.

9/ George Steiner and William G. Ryan, Industrial Project Management, New York Macmillan Company, 1968, pp. 79-80.

10/ Armed Services Procurement Regulation, Sections 3-900, 1-800, 1-707, 7-203.8, 6-100, 3-800, 1-1700, 12-601, and 12-102.3.

11/ Michael D. Reagan, The Managed Economy, New York, Oxford University Press, 1963, p. 193.

12/ Armed Services Procurement Regulation, Section 3-902.1.

13/ Ibid, Sections 1-323, 1-327.1, 1-315, 15-205.31 and 15-205.33.

14/ Department of Defense, Defense Industry Bulletin, November 1967, p. 22.

15/ Steiner and Ryan, op. cit., p. 145.